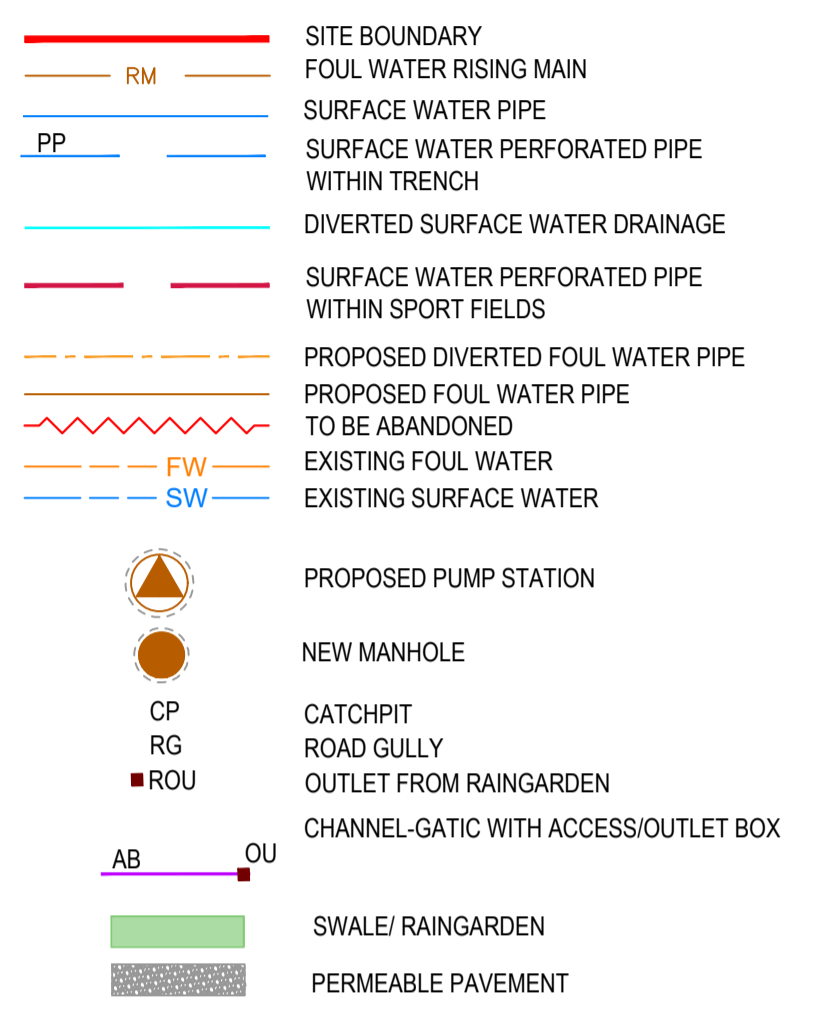


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4. FOR GENERAL NOTES REFER TO DRAWING WCHS-CUR-XX-00-DR-C-92505
5. FINAL DESIGN IS SUBJECT TO CONTRACTOR'S DESIGN PORTION.
6. FURTHER CO-ORDINATION REQUIRED BETWEEN EXTERNAL SERVICES AND THE PROPOSED DRAINAGE.



- DRAWING BASED ON:
- TOPOGRAPHICAL SURVEY JLP SURVEYINGS200641-1
  - UNITED UTILITIES RECORDS
  - GRP SURVEY JLP SURVEYING S20-856
  - CCTV SURVEY DRAIN DOCTOR 14309 SEP 2020
  - FOUNDATIONS RECEIVED 01.03.21
  - LANDSCAPE PLAN WCHS-ALA-00-XX-DR-L-0001-S3 27.04.21
  - GROUND FLOOR WCHS-SRA-XX-00-DR-A-20100 27.04.21
  - ROOF PLAN WCHS-SRA-XX-DR-A-20103 28.04.21

- REQUIRED INFORMATION, CURRENTLY ASSUMED
- POPUP AND DISCHARGE UNITS FOR PROPOSED BUILDING
  - SIPHONIC FLOWS, PIPES SIZE
  - PROPOSED EXTERNAL SERVICES
  - ADDITIONAL CCTV SURVEY

Rev	Description	Date	By	Chkd
P03	ISSUED FOR PLANNING	29/04/21	MW	MW
P02	ISSUED FOR PLANNING	19/04/21	MW	MW
P01	ISSUED FOR COMMENTS- DRAFT CP	08/03/21	MW	MW



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Status: **CONTRACTORS PROPOSALS**

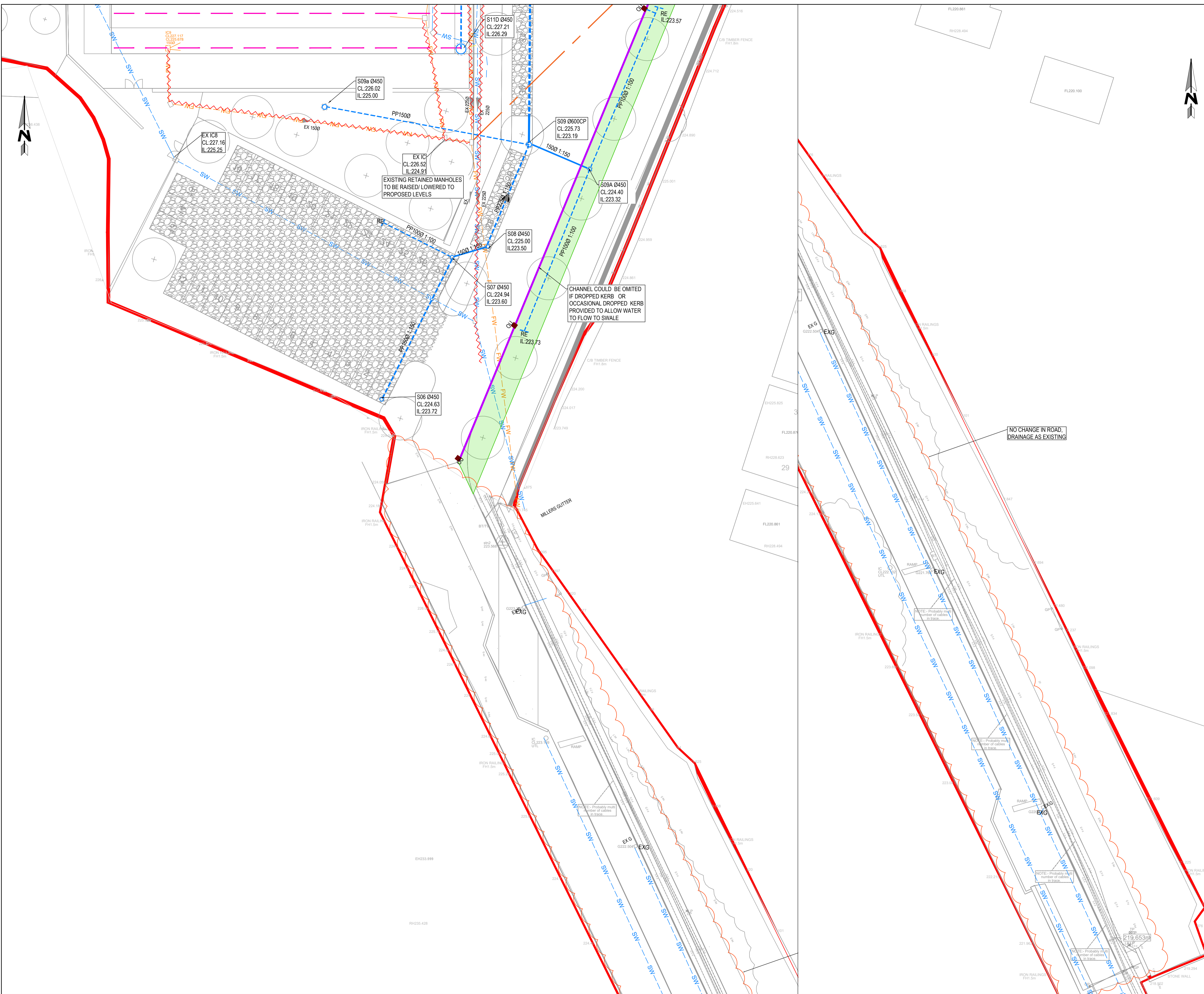
Project: **WHITWORTH COMMUNITY HIGH SCHOOL**

Dwg Title: **PROPOSED DRAINAGE LAYOUT SHEET2**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
078126	A1	08/03/21	MW	MW	MW
Project Code:	Originator:	Volume:	Level:	Type:	Role:
WCHS - CUR - XX - 00 - DR - C -					

92502 - P03

19/03/2021 09:12:26 - Whitworth High School/04-Production/14/Model/Drawings/078126



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- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING WCHS-CUR-XX-00-DR-C-92505
- FINAL DESIGN IS SUBJECT TO CONTRACTOR'S DESIGN PORTION.
- FURTHER CO-ORDINATION REQUIRED BETWEEN EXTERNAL SERVICES AND THE PROPOSED DRAINAGE.

	SITE BOUNDARY
	FOUL WATER RISING MAIN
	SURFACE WATER PIPE
	SURFACE WATER PERFORATED PIPE WITHIN TRENCH
	DIVERTED SURFACE WATER DRAINAGE
	SURFACE WATER PERFORATED PIPE WITHIN SPORT FIELDS
	PROPOSED DIVERTED FOUL WATER PIPE TO BE ABANDONED
	PROPOSED FOUL WATER PIPE TO BE ABANDONED
	EXISTING FOUL WATER
	EXISTING SURFACE WATER
	PROPOSED PUMP STATION
	NEW MANHOLE
	CATCHPIT
	ROAD GULLY
	OUTLET FROM RAINGARDEN
	CHANNEL-GATIC WITH ACCESS/OUTLET BOX
	SWALE/ RAINGARDEN
	PERMEABLE PAVEMENT

- DRAWING BASED ON:
- TOPOGRAPHICAL SURVEY JLP SURVEYINGS200641-1
  - UNITED UTILITIES RECORDS
  - GRP SURVEY JLP SURVEYING S20-856
  - CCTV SURVEY DRAIN DOCTOR 14309 SEP 2020
  - FOUNDATIONS RECEIVED 01.03.21
  - LANDSCAPE PLAN WHS-ALA-00-XX-DR-L-0001-S3 27.04.21
  - GROUND FLOOR WCHS-SRA-XX-00-DR-A-20100 27.04.21
  - ROOF PLAN WCHS-SRA-XX-RF-DR-A-20103 28.04.21

- REQUIRED INFORMATION, CURRENTLY ASSUMED
- POPUP AND DISCHARGE UNITS FOR PROPOSED BUILDING
  - SIPHONIC FLOWS, PIPES SIZE
  - PROPOSED EXTERNAL SERVICES
  - ADDITIONAL CCTV SURVEY

P04	ISSUED FOR PLANNING	29/04/21	MW	MW
P03	ISSUED FOR PLANNING	19/04/21	MW	MW
P02	UPDATED DRAFT CP	24/03/21	MW	MW
P01	ISSUED FOR COMMENTS- DRAFT CP	08/03/21	MW	MW
Rev:	Description:	Date:	By:	Chkd:

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Status: **CONTRACTORS PROPOSALS**

Project: **WHITWORTH COMMUNITY HIGH SCHOOL**

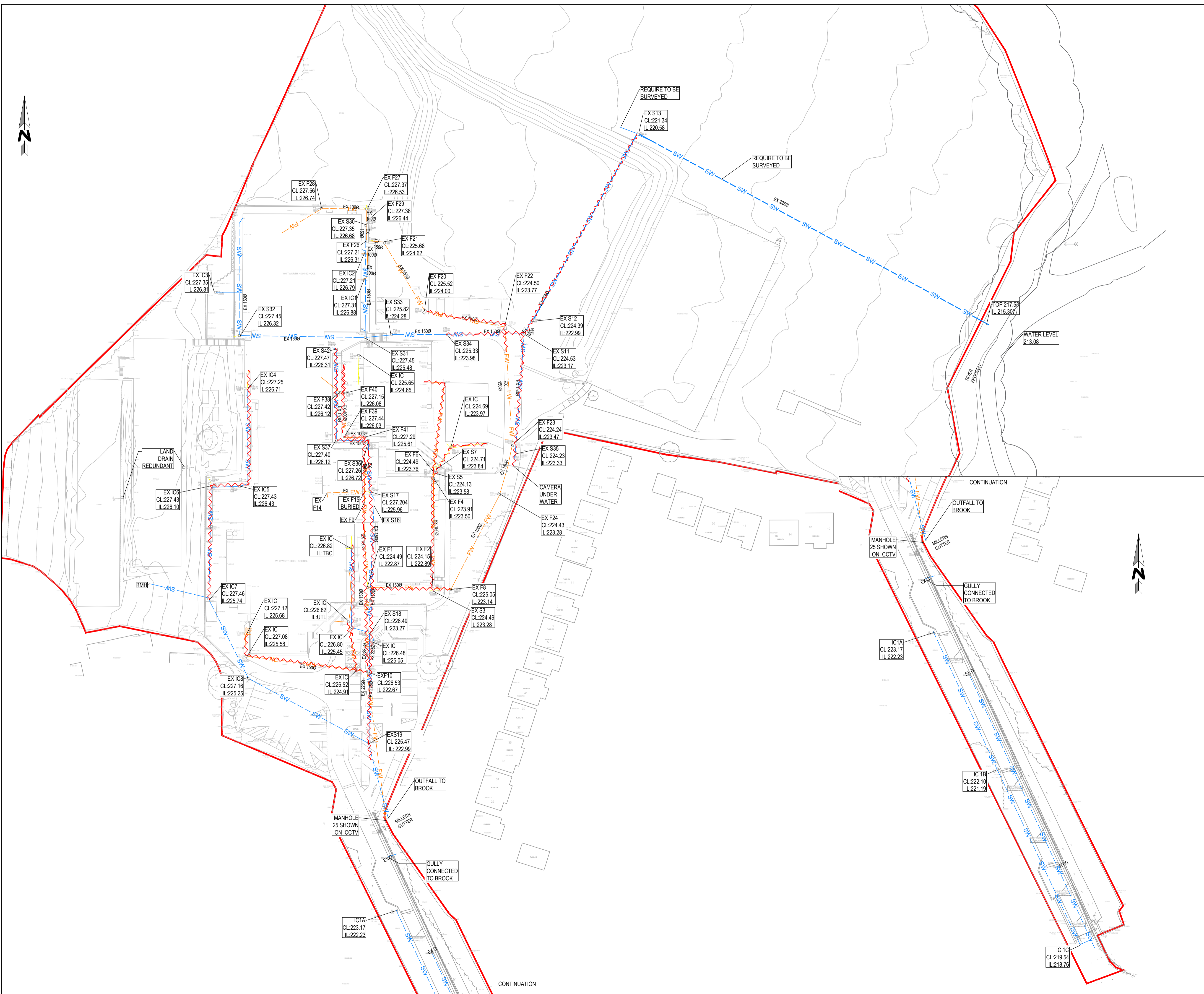
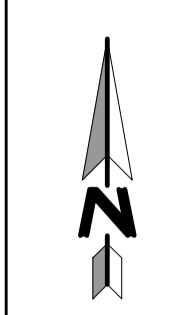
Dwg Title: **PROPOSED DRAINAGE LAYOUT SHEET3**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
078126	A1	08/03/21	MW	MW	MW

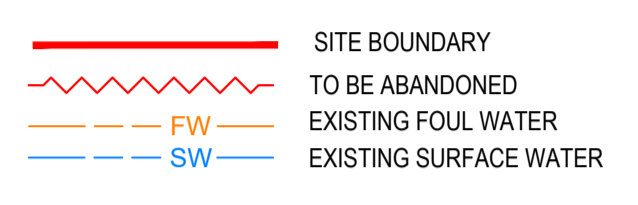
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Project Code:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
WCHS - CUR - XX - 00 - DR - C -						92503 - P04	

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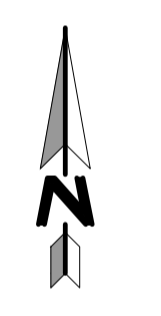
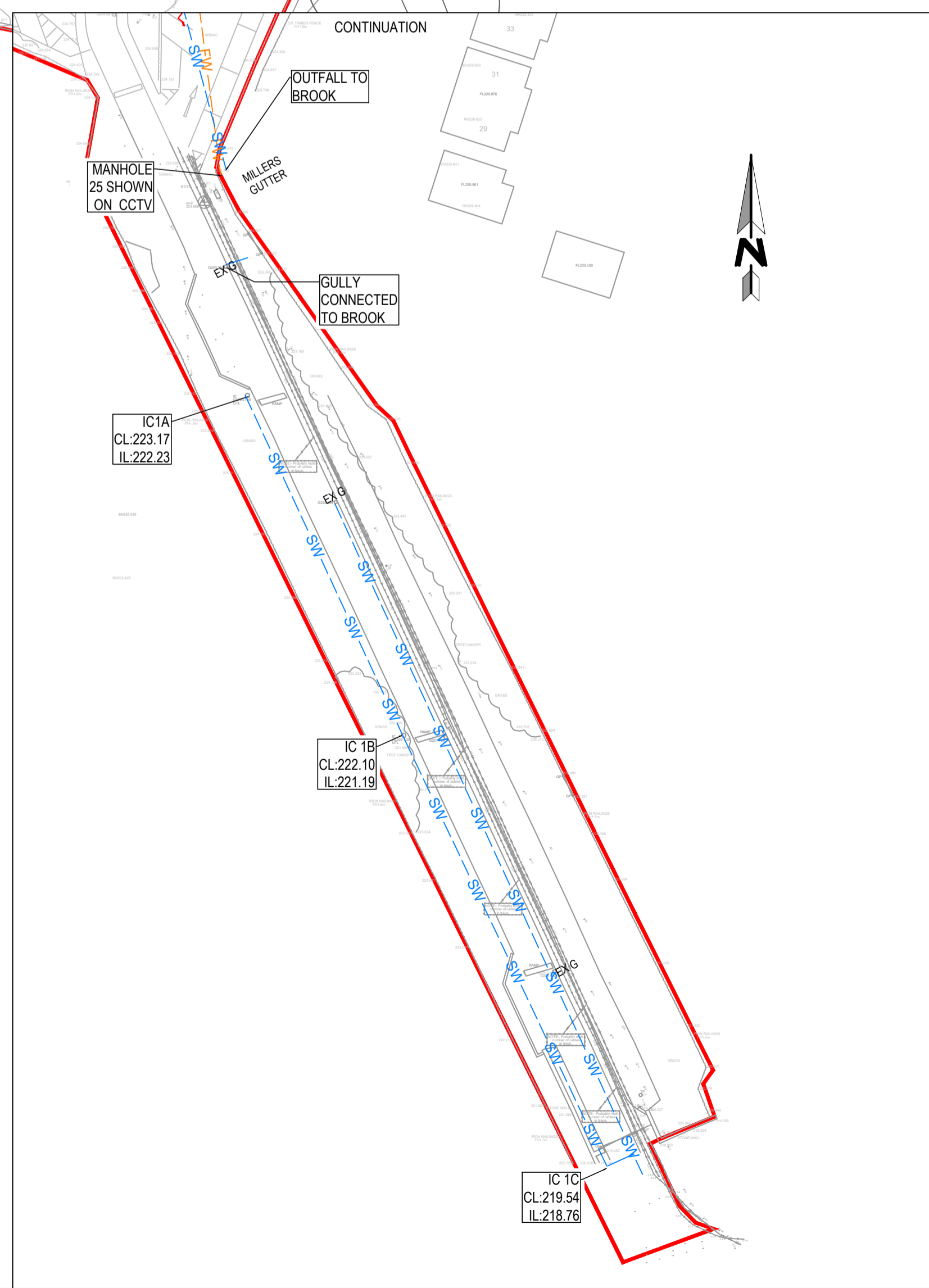


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4. FOR GENERAL NOTES REFER TO DRAWING WCHS-CUR-XX-00-DR-C-92505.
5. FINAL DESIGN IS SUBJECT TO CONTRACTOR'S DESIGN PORTION.
6. FURTHER CO-ORDINATION REQUIRED BETWEEN EXTERNAL SERVICES AND THE PROPOSED DRAINAGE.



- DRAWING BASED ON:
- TOPOGRAPHICAL SURVEY JLP SURVEYINGS200641-1
  - GRP SURVEY JLP SURVEYING S20-856
  - CCTV SURVEY DRAIN DOCTOR 14309 SEP 2020

ADDITIONAL SURVEY IS REQUIRED  
PIPE WHICH HAS NOT BEEN INDICATED TO BE ABANDONED REQUIRES TO BE CLEANED / REPAIRED REFER TO CCTV SURVEY REPORT



P03	ISSUED FOR PLANNING	29/04/21	MW	MW
P02	ISSUED FOR PLANNING	19/04/21	MW	MW
P01	ISSUED FOR COMMENTS- DRAFT CP	08/03/21	MW	MW
Rev	Description	Date	By	Chkd



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Status: **CONTRACTORS PROPOSALS**

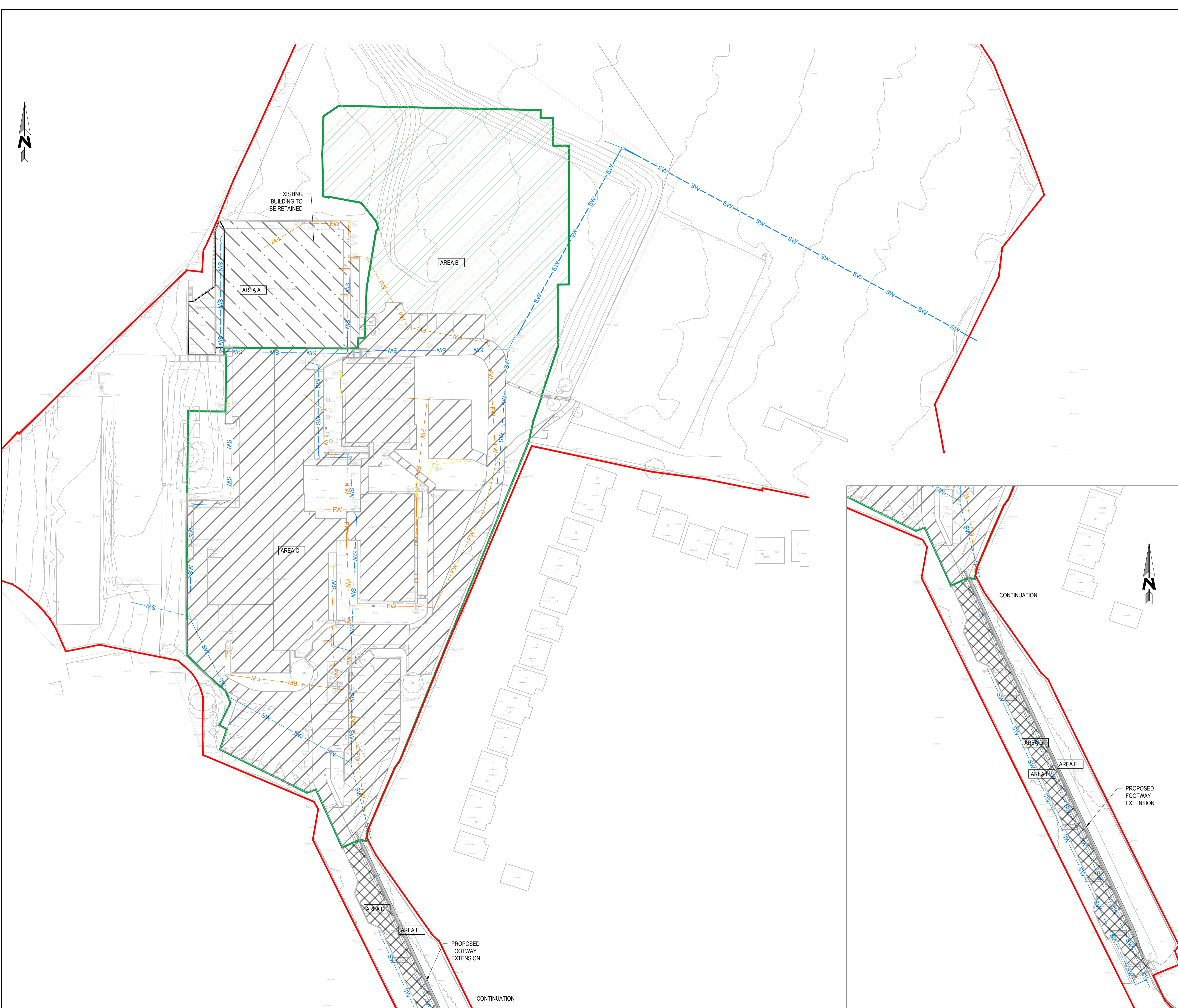
Project: **WHITWORTH COMMUNITY HIGH SCHOOL**

Dwg Title: **EXISTING DRAINAGE TO BE ABANDONED**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
078126	A1	08/03/21	MW	MW	MW
Project Code:	Originator:	Volume:	Level:	Type:	Role:
WCHS - CUR - XX - 00 - DR - C -					

92504 - P03

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3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING EWA-CUR-XX-00-DR-C-92502.
5. FINAL DESIGN IS SUBJECT TO CONTRACTOR'S DESIGN PORTION.
6. FURTHER CO-ORDINATION REQUIRED BETWEEN EXTERNAL SERVICES AND THE PROPOSED DRAINAGE.

— SITE BOUNDARY  
— GREENFIELD RATES 1426m<sup>2</sup>  
 AREA A- EXISTING RETAINED BUILDING AND EXTERNALS  
 AREA B - SOFT LANDSCAPE WHICH WILL BE DEVELOPED  
 AREA C EXISTING HARD SURFACE WHICH WILL BE DEMOLISHED  
 AREA D EXISTING RETAINED ROAD  
 AREA E FOOTWAY WIDENING

P02	ISSUED FOR PLANNING	29/04/21	MW	MW
P01	ISSUED FOR PLANNING	19/04/21	MW	MW
Rev:	Description:	Date:	By:	Chkd:



Status: **CONTRACTORS PROPOSALS**


Project: **WHITWORTH COMMUNITY HIGH SCHOOL**

Dwg Title: **EXISTING CATCHMENTS**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
078126	A1	08/03/21	MW	MW	MW
Scale:	1:500				

Project Code: WCHS - CUR - XX - 00 - DR - C - 92504 - P02













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Curtins Consulting		Page 1
Merchant Exchange 17-19 Whitworth Street West Manchester M1 5WG		
Date 20/04/2021 10:39 File planning.MDX	Designed by marta.wolska Checked by	
Micro Drainage		Network 2018.1.1

STORM SEWER DESIGN by the Modified Rational Method


Network Design Table for Storm

# - Indicates pipe length does not match coordinates  
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	4.388	0.439	10.0	0.115	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	14.505	0.725	20.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	6.955	0.023	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	18.678	0.062	300.0	0.063	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	3.004	0.751	4.0	0.115	5.00	0.0	0.600	o	100	Pipe/Conduit	
S2.001	14.638	0.244	60.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	11.698	0.146	80.1	0.076	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	19.922	0.066	301.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	13.626	0.170	80.0	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	18.725	0.125	149.8	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.001	4.045	0.027	149.8	0.027	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.002	12.842	0.086	149.3	0.003	0.00	0.0	0.600	o	225	Pipe/Conduit	












Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.03	225.000	0.115	0.0	0.0	0.0	2.46	19.3	15.5
S1.001	50.00	5.10	224.300	0.115	0.0	0.0	0.0	3.53	249.6	15.5
S1.002	50.00	5.23	223.575	0.115	0.0	0.0	0.0	0.90	63.8	15.5
S1.003	50.00	5.57	223.552	0.177	0.0	0.0	0.0	0.90	63.8	24.0
S2.000	50.00	5.01	225.000	0.115	0.0	0.0	0.0	3.89	30.6	15.6
S2.001	50.00	5.13	224.199	0.115	0.0	0.0	0.0	2.03	143.7	15.6
S3.000	50.00	5.17	223.800	0.076	0.0	0.0	0.0	1.12	19.9	10.2
S1.004	49.37	5.94	223.489	0.368	0.0	0.0	0.0	0.90	63.6	49.2
S1.005	48.96	6.07	223.423	0.372	0.0	0.0	0.0	1.76	124.4	49.3
S4.000	50.00	5.38	223.720	0.033	0.0	0.0	0.0	0.82	14.5	4.5
S4.001	50.00	5.46	223.595	0.060	0.0	0.0	0.0	0.82	14.5	8.1
S4.002	50.00	5.66	223.500	0.063	0.0	0.0	0.0	1.07	42.5	8.5

Curtins Consulting		Page 2
Merchant Exchange 17-19 Whitworth Street West Manchester M1 5WG		
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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S5.000	19.769	0.198	99.8	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit		
S6.000	20.302	0.203	100.0	0.024	5.00	0.0	0.600	o	100	Pipe/Conduit		
S5.001	7.688	0.051	150.7	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit		
S4.003	33.074	0.147	225.0	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit		
S4.004	33.074	0.147	225.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit		
S7.000	12.032	0.120	100.3	0.066	5.00	0.0	0.600	o	150	Pipe/Conduit		
S7.001	9.091	0.061	149.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S7.002	9.186	0.061	150.6	0.050	0.00	0.0	0.600	o	225	Pipe/Conduit		
S7.003	7.369	1.474	5.0	0.060	0.00	0.0	0.600	o	150	Pipe/Conduit		
S4.005	10.575	0.047	225.0	0.005	0.00	0.0	0.600	o	225	Pipe/Conduit		
S8.000	22.465	0.150	149.8	0.022	5.00	0.0	0.600	o	150	Pipe/Conduit		












Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S5.000	50.00	5.43	223.730	0.020	0.0	0.0	0.0	0.77	6.0	2.6
S6.000	50.00	5.44	223.570	0.024	0.0	0.0	0.0	0.77	6.0	3.3
S5.001	50.00	5.60	223.317	0.049	0.0	0.0	0.0	0.82	14.4	6.6
S4.003	48.26	6.30	223.191	0.116	0.0	0.0	0.0	0.87	34.5	15.2
S4.004	46.45	6.93	223.044	0.123	0.0	0.0	0.0	0.87	34.5	15.5
S7.000	50.00	5.20	226.220	0.066	0.0	0.0	0.0	1.00	17.7	8.9
S7.001	50.00	5.38	226.100	0.066	0.0	0.0	0.0	0.82	14.5	8.9
S7.002	50.00	5.53	225.964	0.116	0.0	0.0	0.0	1.06	42.3	15.7
S7.003	50.00	5.56	225.928	0.176	0.0	0.0	0.0	4.54	80.2	23.8
S4.005	45.91	7.14	222.897	0.304	0.0	0.0	0.0	0.87	34.5<	37.8
S8.000	50.00	5.46	224.550	0.022	0.0	0.0	0.0	0.82	14.5	3.0

Curtins Consulting		Page 3
Merchant Exchange 17-19 Whitworth Street West Manchester M1 5WG		
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Micro Drainage		Network 2018.1.1


STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.006	8.813	0.039	226.0	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.007	4.608	0.087	53.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.000	35.786	0.795	45.0	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	7.543	0.050	150.9	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S10.000	6.996	0.031	225.7	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.008	16.599	0.074	224.3	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	
S11.000	4.003	0.040	100.1	0.022	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.001	13.429	0.090	149.2	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.002	5.898	0.039	151.2	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	9.271	0.062	149.5	0.061	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	34.400	0.344	100.0	0.033	5.00	0.0	0.600	o	100	Pipe/Conduit	









Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.006	45.46	7.31	222.850	0.343	0.0	0.0	0.0	0.87	34.4«	42.2
S4.007	45.36	7.35	222.736	0.343	0.0	0.0	0.0	1.80	71.6	42.2
S9.000	50.00	5.40	224.000	0.012	0.0	0.0	0.0	1.50	26.6	1.6
S9.001	50.00	5.55	223.205	0.018	0.0	0.0	0.0	0.82	14.4	2.5
S10.000	50.00	5.11	222.680	0.000	0.0	0.0	0.0	1.04	73.7	0.0
S4.008	44.69	7.61	222.574	0.384	0.0	0.0	0.0	1.05	73.9	46.5
S11.000	50.00	5.09	223.230	0.022	0.0	0.0	0.0	0.77	6.0	3.0
S11.001	50.00	5.36	223.140	0.037	0.0	0.0	0.0	0.82	14.5	5.0
S11.002	50.00	5.48	223.050	0.048	0.0	0.0	0.0	0.81	14.4	6.5
S1.006	44.23	7.80	222.520	0.865	0.0	0.0	0.0	0.82	14.5«	103.6
S12.000	50.00	5.75	226.660	0.033	0.0	0.0	0.0	0.77	6.0	4.4

Curtins Consulting		Page 4
Merchant Exchange 17-19 Whitworth Street West Manchester M1 5WG		
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Micro Drainage		Network 2018.1.1

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S12.001	36.428	0.837	43.5	0.031	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.000	32.178	0.619	52.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.002	9.029	0.090	100.3	0.026	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.003	15.723	0.297	53.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.004	21.590	0.360	60.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	19.350	0.086	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	62.850	1.571	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	246.000#	5.279	46.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.001	48.74	6.14	226.320	0.063	0.0	0.0	0.0	1.53	27.0	8.3
S13.000	50.00	5.38	226.680	0.027	0.0	0.0	0.0	1.40	24.7	3.7
S12.002	48.28	6.29	225.483	0.117	0.0	0.0	0.0	1.00	17.7	15.3
S12.003	47.72	6.48	224.280	0.117	0.0	0.0	0.0	1.38	24.5	15.3
S12.004	46.94	6.76	223.983	0.117	0.0	0.0	0.0	1.30	23.0	15.3
S1.007	43.37	8.18	222.350	0.982	0.0	0.0	0.0	0.87	34.5«	115.3
S1.008	42.25	8.68	222.290	0.982	0.0	0.0	0.0	2.07	82.5«	115.3
S1.009	38.25	10.81	220.580	0.982	0.0	0.0	0.0	1.92	76.4«	115.3



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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	226.000	1.000	Open Manhole	1200	S1.000	225.000	100				
SRWP	225.000	0.700	Open Manhole	300	S1.001	224.300	300	S1.000	224.561	100	61
S1	224.930	1.355	Open Manhole	600	S1.002	223.575	300	S1.001	223.575	300	
S2	224.910	1.358	Open Manhole	600	S1.003	223.552	300	S1.002	223.552	300	
S4	226.000	1.000	Open Manhole	1200	S2.000	225.000	100				
SRWP	225.000	0.801	Open Manhole	300	S2.001	224.199	300	S2.000	224.249	100	
S7	224.760	0.960	Open Manhole	1200	S3.000	223.800	150				
S3	224.950	1.461	Open Manhole	600	S1.004	223.489	300	S1.003	223.489	300	
								S2.001	223.955	300	466
								S3.000	223.654	150	15
S4	225.130	1.707	Open Manhole	600	S1.005	223.423	300	S1.004	223.423	300	
S6	224.630	0.910	Open Manhole	600	S4.000	223.720	150				
S7	224.940	1.345	Open Manhole	600	S4.001	223.595	150	S4.000	223.595	150	
S8	225.000	1.500	Open Manhole	600	S4.002	223.500	225	S4.001	223.568	150	
SRE	224.400	0.670	Open Manhole	150	S5.000	223.730	100				
SRE	224.400	0.830	Open Manhole	150	S6.000	223.570	100				
S9A	224.400	1.083	Open Manhole	600	S5.001	223.317	150	S5.000	223.532	100	165
								S6.000	223.367	100	
S9	225.730	2.539	Open Manhole	600	S4.003	223.191	225	S4.002	223.414	225	223
								S5.001	223.266	150	
S10	225.580	2.536	Open Manhole	600	S4.004	223.044	225	S4.003	223.044	225	
S15	227.750	1.530	Open Manhole	600	S7.000	226.220	150				
S11A	227.830	1.730	Open Manhole	600	S7.001	226.100	150	S7.000	226.100	150	
S11B	227.800	1.836	Open Manhole	600	S7.002	225.964	225	S7.001	226.039	150	
S11C	227.710	1.807	Open Manhole	600	S7.003	225.928	150	S7.002	225.903	225	
S11	225.751	2.854	Open Manhole	600	S4.005	222.897	225	S4.004	222.897	225	
								S7.003	224.454	150	1482
S12A	226.040	1.490	Open Manhole	600	S8.000	224.550	150				
S12	225.630	2.780	Open Manhole	600	S4.006	222.850	225	S4.005	222.850	225	
								S8.000	224.400	150	1475
S13	225.350	2.614	Open Manhole	1200	S4.007	222.736	225	S4.006	222.811	225	75
S14	224.940	0.940	Open Manhole	600	S9.000	224.000	150				
S15	224.840	1.635	Open Manhole	600	S9.001	223.205	150	S9.000	223.205	150	
S16a	224.830	2.150	Open Manhole	1200	S10.000	222.680	300				

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., I*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S16	225.020	2.446	Open Manhole	600	S4.008	222.574	300	S4.007	222.649	225	
								S9.001	223.155	150	431
								S10.000	222.649	300	75
SRE	224.410	1.180	Open Manhole	600	S11.000	223.230	100				
S16	224.410	1.270	Open Manhole	600	S11.001	223.140	150	S11.000	223.190	100	
S17	224.760	1.710	Open Manhole	600	S11.002	223.050	150	S11.001	223.050	150	
S5	224.890	2.390	Open Manhole	1800	S1.006	222.520	150	S1.005	223.253	300	883
								S4.008	222.500	300	
								S11.002	223.011	150	491
SEXRE	227.380	0.720	Sealed Manhole	600	S12.000	226.660	100				
SEX32	227.450	1.134	Open Manhole	600	S12.001	226.320	150	S12.000	226.316	100	
SEX30	227.350	0.670	Open Manhole	600	S13.000	226.680	150				
SEX31	227.450	1.967	Open Manhole	600	S12.002	225.483	150	S12.001	225.483	150	
								S13.000	226.061	150	578
SEX33	225.820	1.540	Open Manhole	600	S12.003	224.280	150	S12.002	225.393	150	1113
SEX34	225.330	1.347	Open Manhole	600	S12.004	223.983	150	S12.003	223.983	150	
SD01	224.760	2.410	Open Manhole	600	S1.007	222.350	225	S1.006	222.458	150	33
								S12.004	223.623	150	1198
SD02	224.240	1.976	Open Manhole	600	S1.008	222.290	225	S1.007	222.264	225	
SEX13	221.340	0.760	Open Manhole	600	S1.009	220.580	225	S1.008	220.719	225	139
S	217.530	2.229	Open Manhole	0		OUTFALL		S1.009	215.301	225	

PIPELINE SCHEDULES for Storm


Upstream Manhole

# - Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S1.000	o	100	S1	226.000	225.000	0.900	Open Manhole		1200
S1.001	o	300	SRWP	225.000	224.300	0.400	Open Manhole		300
S1.002	o	300	S1	224.930	223.575	1.055	Open Manhole		600
S1.003	o	300	S2	224.910	223.552	1.058	Open Manhole		600
S2.000	o	100	S4	226.000	225.000	0.900	Open Manhole		1200
S2.001	o	300	SRWP	225.000	224.199	0.501	Open Manhole		300
S3.000	o	150	S7	224.760	223.800	0.810	Open Manhole		1200
S1.004	o	300	S3	224.950	223.489	1.161	Open Manhole		600
S1.005	o	300	S4	225.130	223.423	1.407	Open Manhole		600
S4.000	o	150	S6	224.630	223.720	0.760	Open Manhole		600
S4.001	o	150	S7	224.940	223.595	1.195	Open Manhole		600
S4.002	o	225	S8	225.000	223.500	1.275	Open Manhole		600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S1.000	4.388	10.0	SRWP	225.000	224.561	0.339	Open Manhole		300
S1.001	14.505	20.0	S1	224.930	223.575	1.055	Open Manhole		600
S1.002	6.955	300.0	S2	224.910	223.552	1.058	Open Manhole		600
S1.003	18.678	300.0	S3	224.950	223.489	1.161	Open Manhole		600
S2.000	3.004	4.0	SRWP	225.000	224.249	0.651	Open Manhole		300
S2.001	14.638	60.0	S3	224.950	223.955	0.695	Open Manhole		600
S3.000	11.698	80.1	S3	224.950	223.654	1.146	Open Manhole		600
S1.004	19.922	301.8	S4	225.130	223.423	1.407	Open Manhole		600
S1.005	13.626	80.0	S5	224.890	223.253	1.337	Open Manhole		1800
S4.000	18.725	149.8	S7	224.940	223.595	1.195	Open Manhole		600
S4.001	4.045	149.8	S8	225.000	223.568	1.282	Open Manhole		600
S4.002	12.842	149.3	S9	225.730	223.414	2.091	Open Manhole		600

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S5.000	o	100	SRE	224.400	223.730	0.570	Open Manhole		150
S6.000	o	100	SRE	224.400	223.570	0.730	Open Manhole		150
S5.001	o	150	S9A	224.400	223.317	0.933	Open Manhole		600
S4.003	o	225	S9	225.730	223.191	2.314	Open Manhole		600
S4.004	o	225	S10	225.580	223.044	2.311	Open Manhole		600
S7.000	o	150	S15	227.750	226.220	1.380	Open Manhole		600
S7.001	o	150	S11A	227.830	226.100	1.580	Open Manhole		600
S7.002	o	225	S11B	227.800	225.964	1.611	Open Manhole		600
S7.003	o	150	S11C	227.710	225.928	1.632	Open Manhole		600
S4.005	o	225	S11	225.751	222.897	2.629	Open Manhole		600
S8.000	o	150	S12A	226.040	224.550	1.340	Open Manhole		600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S5.000	19.769	99.8	S9A	224.400	223.532	0.768	Open Manhole		600
S6.000	20.302	100.0	S9A	224.400	223.367	0.933	Open Manhole		600
S5.001	7.688	150.7	S9	225.730	223.266	2.314	Open Manhole		600
S4.003	33.074	225.0	S10	225.580	223.044	2.311	Open Manhole		600
S4.004	33.074	225.0	S11	225.751	222.897	2.629	Open Manhole		600
S7.000	12.032	100.3	S11A	227.830	226.100	1.580	Open Manhole		600
S7.001	9.091	149.0	S11B	227.800	226.039	1.611	Open Manhole		600
S7.002	9.186	150.6	S11C	227.710	225.903	1.582	Open Manhole		600
S7.003	7.369	5.0	S11	225.751	224.454	1.147	Open Manhole		600
S4.005	10.575	225.0	S12	225.630	222.850	2.555	Open Manhole		600
S8.000	22.465	149.8	S12	225.630	224.400	1.080	Open Manhole		600

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S4.006	o	225	S12	225.630	222.850	2.555	Open Manhole	600
S4.007	o	225	S13	225.350	222.736	2.389	Open Manhole	1200
S9.000	o	150	S14	224.940	224.000	0.790	Open Manhole	600
S9.001	o	150	S15	224.840	223.205	1.485	Open Manhole	600
S10.000	o	300	S16a	224.830	222.680	1.850	Open Manhole	1200
S4.008	o	300	S16	225.020	222.574	2.146	Open Manhole	600
S11.000	o	100	SRE	224.410	223.230	1.080	Open Manhole	600
S11.001	o	150	S16	224.410	223.140	1.120	Open Manhole	600
S11.002	o	150	S17	224.760	223.050	1.560	Open Manhole	600
S1.006	o	150	S5	224.890	222.520	2.220	Open Manhole	1800
S12.000	o	100	SEXRE	227.380	226.660	0.620	Sealed Manhole	600
S12.001	o	150	SEX32	227.450	226.320	0.980	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S4.006	8.813	226.0	S13	225.350	222.811	2.314	Open Manhole	1200
S4.007	4.608	53.0	S16	225.020	222.649	2.146	Open Manhole	600
S9.000	35.786	45.0	S15	224.840	223.205	1.485	Open Manhole	600
S9.001	7.543	150.9	S16	225.020	223.155	1.715	Open Manhole	600
S10.000	6.996	225.7	S16	225.020	222.649	2.071	Open Manhole	600
S4.008	16.599	224.3	S5	224.890	222.500	2.090	Open Manhole	1800
S11.000	4.003	100.1	S16	224.410	223.190	1.120	Open Manhole	600
S11.001	13.429	149.2	S17	224.760	223.050	1.560	Open Manhole	600
S11.002	5.898	151.2	S5	224.890	223.011	1.729	Open Manhole	1800
S1.006	9.271	149.5	SD01	224.760	222.458	2.152	Open Manhole	600
S12.000	34.400	100.0	SEX32	227.450	226.316	1.034	Open Manhole	600
S12.001	36.428	43.5	SEX31	227.450	225.483	1.817	Open Manhole	600

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PIPELINE SCHEDULES for Storm

Upstream Manhole


PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.000	o	150	SEX30	227.350	226.680	0.520	Open Manhole	600
S12.002	o	150	SEX31	227.450	225.483	1.817	Open Manhole	600
S12.003	o	150	SEX33	225.820	224.280	1.390	Open Manhole	600
S12.004	o	150	SEX34	225.330	223.983	1.197	Open Manhole	600
S1.007	o	225	SD01	224.760	222.350	2.185	Open Manhole	600
S1.008	o	225	SD02	224.240	222.290	1.725	Open Manhole	600
S1.009	o	225	SEX13	221.340	220.580	0.535	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.000	32.178	52.0	SEX31	227.450	226.061	1.239	Open Manhole	600
S12.002	9.029	100.3	SEX33	225.820	225.393	0.277	Open Manhole	600
S12.003	15.723	53.0	SEX34	225.330	223.983	1.197	Open Manhole	600
S12.004	21.590	60.0	SD01	224.760	223.623	0.987	Open Manhole	600
S1.007	19.350	225.0	SD02	224.240	222.264	1.751	Open Manhole	600
S1.008	62.850	40.0	SEX13	221.340	220.719	0.396	Open Manhole	600
S1.009	246.000#	46.6	S	217.530	215.301	2.004	Open Manhole	0

Area Summary for Storm


Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.115	0.115	0.115
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.063	0.063	0.063
2.000	User	-	100	0.115	0.115	0.115
2.001	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.076	0.076	0.076
1.004	-	-	100	0.000	0.000	0.000
1.005	User	-	100	0.004	0.004	0.004
4.000	-	-	100	0.033	0.033	0.033
4.001	User	-	100	0.027	0.027	0.027
4.002	User	-	100	0.003	0.003	0.003
5.000	User	-	100	0.020	0.020	0.020
6.000	User	-	100	0.024	0.024	0.024
5.001	User	-	100	0.005	0.005	0.005
4.003	User	-	100	0.004	0.004	0.004
4.004	User	-	100	0.007	0.007	0.007
7.000	User	-	100	0.066	0.066	0.066
7.001	-	-	100	0.000	0.000	0.000
7.002	-	-	100	0.050	0.050	0.050
7.003	-	-	100	0.060	0.060	0.060
4.005	User	-	100	0.005	0.005	0.005
8.000	User	-	100	0.022	0.022	0.022
4.006	User	-	100	0.017	0.017	0.017
4.007	-	-	100	0.000	0.000	0.000
9.000	User	-	100	0.012	0.012	0.012
9.001	User	-	100	0.007	0.007	0.007
10.000	-	-	100	0.000	0.000	0.000
4.008	User	-	100	0.023	0.023	0.023
11.000	User	-	100	0.022	0.022	0.022
11.001	User	-	100	0.015	0.015	0.015
11.002	User	-	100	0.011	0.011	0.011
1.006	User	-	100	0.061	0.061	0.061
12.000	User	-	100	0.033	0.033	0.033
12.001	User	-	100	0.031	0.031	0.031
13.000	User	-	100	0.027	0.027	0.027
12.002	User	-	100	0.026	0.026	0.026
12.003	-	-	100	0.000	0.000	0.000
12.004	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.982	0.982	0.982

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Free Flowing Outfall Details for Storm

<b>Outfall Pipe Number</b>	<b>Outfall Name</b>	<b>C. Level (m)</b>	<b>I. Level (m)</b>	<b>Min I. Level (m)</b>	<b>D,L (mm)</b>	<b>W (mm)</b>
S1.009	S	217.530	215.301	0.000	0	0



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Online Controls for Storm

Complex Manhole: S5, DS/PN: S1.006, Volume (m³): 8.1

Hydro-Brake® Optimum

Unit Reference MD-SHE-0191-1700-0500-1700  
 Design Head (m) 0.500  
 Design Flow (l/s) 17.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 191  
 Invert Level (m) 222.520  
 Minimum Outlet Pipe Diameter (mm) 225  
 Suggested Manhole Diameter (mm) 1200


Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	17.0	Kick-Flo®	0.422	15.7
Flush-Flo™	0.270	17.0	Mean Flow over Head Range	-	12.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	25.8	3.000	40.1	7.000	60.3
0.200	16.6	1.400	27.8	3.500	43.2	7.500	62.5
0.300	16.9	1.600	29.6	4.000	46.1	8.000	64.6
0.400	16.1	1.800	31.3	4.500	48.8	8.500	66.6
0.500	17.0	2.000	32.9	5.000	51.3	9.000	68.5
0.600	18.5	2.200	34.5	5.500	53.4	9.500	70.4
0.800	21.2	2.400	36.0	6.000	55.8		
1.000	23.6	2.600	37.4	6.500	58.1		

Orifice

Diameter (m) 0.090 Discharge Coefficient 0.600 Invert Level (m) 223.220

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Storage Structures for Storm

Porous Car Park Manhole: S7, DS/PN: S4.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	21.0
Membrane Percolation (mm/hr)	1000	Length (m)	29.0
Max Percolation (l/s)	169.2	Slope (1:X)	15.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	224.490	Cap Volume Depth (m)	0.350

Infiltration Trench Manhole: SRE, DS/PN: S5.000

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	38.0
Safety Factor	2.0	Slope (1:X)	53.0
Porosity	0.30	Cap Volume Depth (m)	0.700
Invert Level (m)	223.730	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: SRE, DS/PN: S6.000


Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	21.0
Safety Factor	2.0	Slope (1:X)	53.0
Porosity	0.30	Cap Volume Depth (m)	0.710
Invert Level (m)	223.570	Cap Infiltration Depth (m)	0.000

Porous Car Park Manhole: S9, DS/PN: S4.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.4
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	8.0	Slope (1:X)	37.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	225.280	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S10, DS/PN: S4.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.4
Membrane Percolation (mm/hr)	1000	Length (m)	30.0
Max Percolation (l/s)	20.0	Slope (1:X)	74.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	225.130	Cap Volume Depth (m)	0.350

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Porous Car Park Manhole: S11, DS/PN: S4.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.4
Membrane Percolation (mm/hr)	1000	Length (m)	36.0
Max Percolation (l/s)	24.0	Slope (1:X)	347.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	225.300	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S12, DS/PN: S4.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	24.0
Max Percolation (l/s)	32.0	Slope (1:X)	119.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	225.180	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S15, DS/PN: S9.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	36.0
Max Percolation (l/s)	48.0	Slope (1:X)	46.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	224.310	Cap Volume Depth (m)	0.350

Complex Manhole: S16a, DS/PN: S10.000


Cellular Storage

Invert Level (m)	222.780	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	250.0	0.0	1.201	50.0	0.0
1.200	250.0	0.0			

Bio-Retention Area

Invert Level (m)	223.980	Infiltration Coefficient Side (m/hr)	0.00000
Porosity	0.33	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000		

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Bio-Retention Area

Depth (m)	Area (m <sup>2</sup> )	Perimeter (m)	Depth (m)	Area (m <sup>2</sup> )	Perimeter (m)
0.000	180.0	47.560	0.600	180.0	47.560

Porous Car Park Manhole: S16, DS/PN: S4.008

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	7.2
Max Percolation (l/s)	9.6	Slope (1:X)	56.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	224.570	Cap Volume Depth (m)	0.350

Complex Manhole: SRE, DS/PN: S11.000

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.4
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	40.0
Porosity	0.30	Cap Volume Depth (m)	0.750
Invert Level (m)	223.230	Cap Infiltration Depth (m)	0.000


Swale

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	60.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	4.0
Safety Factor	2.0	Slope (1:X)	40.0
Porosity	1.00	Cap Volume Depth (m)	0.450
Invert Level (m)	223.980	Cap Infiltration Depth (m)	0.000
Base Width (m)	0.8	Include Swale Volume	Yes

Porous Car Park Manhole: S17, DS/PN: S11.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.8
Max Percolation (l/s)	18.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	224.310	Cap Volume Depth (m)	0.350

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0 Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000


Number of Input Hydrographs 0 Number of Storage Structures 12  
Number of Online Controls 1 Number of Time/Area Diagrams 2  
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.250  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm) 19.000 Cv (Winter) 0.840  
Margin for Flood Risk Warning (mm) 300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status OFF  
DVD Status ON  
Inertia Status ON


Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	120 Winter	1	+0%	100/30 Summer			
S1.001	SRWP	120 Winter	1	+0%				
S1.002	S1	120 Winter	1	+0%	100/15 Summer			
S1.003	S2	120 Winter	1	+0%	100/15 Summer			
S2.000	S4	120 Summer	1	+0%				
S2.001	SRWP	120 Summer	1	+0%				
S3.000	S7	15 Winter	1	+0%	30/15 Summer			
S1.004	S3	15 Winter	1	+0%	100/15 Summer			
S1.005	S4	15 Winter	1	+0%	100/15 Summer			
S4.000	S6	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S4.001	S7	15 Winter	1	+0%	30/15 Summer			
S4.002	S8	15 Winter	1	+0%	30/15 Summer			
S5.000	SRE	15 Winter	1	+0%	30/15 Summer	100/15 Summer		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	225.033	-0.067	0.000	0.24	4.0	OK	
S1.001	SRWP	224.328	-0.272	0.000	0.02	4.0	OK	
S1.002	S1	223.642	-0.233	0.000	0.09	4.0	OK	
S1.003	S2	223.628	-0.223	0.000	0.12	6.5	OK	
S2.000	S4	225.028	-0.072	0.000	0.17	4.0	OK	
S2.001	SRWP	224.235	-0.264	0.000	0.03	4.0	OK	
S3.000	S7	223.873	-0.077	0.000	0.47	8.5	OK	
S1.004	S3	223.593	-0.196	0.000	0.26	14.3	OK	
S1.005	S4	223.499	-0.225	0.000	0.14	14.6	OK	
S4.000	S6	223.774	-0.096	0.000	0.27	3.7	OK	6
S4.001	S7	223.656	-0.089	0.000	0.34	3.7	OK	
S4.002	S8	223.549	-0.176	0.000	0.11	4.0	OK	
S5.000	SRE	223.773	-0.057	0.000	0.38	2.2	OK	7

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.000	SRE	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S5.001	S9A	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S4.003	S9	15 Winter	1	+0%	30/15 Summer			
S4.004	S10	15 Winter	1	+0%	30/15 Summer			
S7.000	S15	15 Winter	1	+0%	30/15 Summer			
S7.001	S11A	15 Winter	1	+0%	30/15 Summer			
S7.002	S11B	15 Winter	1	+0%	100/15 Summer			
S7.003	S11C	15 Winter	1	+0%	100/15 Summer			
S4.005	S11	15 Winter	1	+0%	1/15 Summer			
S8.000	S12A	15 Winter	1	+0%				
S4.006	S12	15 Winter	1	+0%	1/15 Summer			
S4.007	S13	15 Winter	1	+0%	1/15 Summer			
S9.000	S14	15 Winter	1	+0%				
S9.001	S15	15 Winter	1	+0%	100/15 Summer			
S10.000	S16a	120 Winter	1	+0%	30/15 Winter			
S4.008	S16	15 Winter	1	+0%	1/15 Summer			
S11.000	SRE	15 Winter	1	+0%	30/15 Summer			
S11.001	S16	15 Winter	1	+0%	30/15 Summer			
S11.002	S17	15 Winter	1	+0%	30/15 Summer			
S1.006	S5	15 Winter	1	+0%	1/15 Summer			
S12.000	SEXRE	15 Winter	1	+0%	30/15 Summer			
S12.001	SEX32	15 Winter	1	+0%	100/15 Summer			
S13.000	SEX30	15 Winter	1	+0%				
S12.002	SEX31	15 Winter	1	+0%	30/15 Summer			
S12.003	SEX33	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
S12.004	SEX34	15 Winter	1	+0%	30/15 Summer			
S1.007	SD01	15 Winter	1	+0%	30/15 Summer			
S1.008	SD02	15 Winter	1	+0%				
S1.009	SEX13	15 Winter	1	+0%				


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.000	SRE	223.619	-0.051	0.000	0.46	2.7	OK	8
S5.001	S9A	223.387	-0.080	0.000	0.43	5.4	OK	7
S4.003	S9	223.273	-0.143	0.000	0.28	9.2	OK	
S4.004	S10	223.205	-0.064	0.000	0.26	8.4	OK	
S7.000	S15	226.292	-0.078	0.000	0.46	7.4	OK	
S7.001	S11A	226.183	-0.067	0.000	0.58	7.4	OK	
S7.002	S11B	226.057	-0.132	0.000	0.35	12.2	OK	
S7.003	S11C	225.980	-0.098	0.000	0.26	17.9	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S4.005	S11	223.181	0.059	0.000	0.72	21.0	SURCHARGED	
S8.000	S12A	224.593	-0.107	0.000	0.18	2.5	OK	
S4.006	S12	223.137	0.062	0.000	0.85	24.0	SURCHARGED	
S4.007	S13	223.075	0.114	0.000	0.58	24.0	SURCHARGED	
S9.000	S14	224.022	-0.128	0.000	0.05	1.3	OK	
S9.001	S15	223.237	-0.118	0.000	0.10	1.3	OK	
S10.000	S16a	222.866	-0.114	0.000	0.27	14.1	OK	
S4.008	S16	223.012	0.138	0.000	0.26	16.4	SURCHARGED	
S11.000	SRE	223.279	-0.051	0.000	0.48	2.4	OK	
S11.001	S16	223.196	-0.094	0.000	0.29	3.9	OK	
S11.002	S17	223.116	-0.084	0.000	0.39	4.6	OK	
S1.006	S5	223.038	0.368	0.000	1.32	16.9	SURCHARGED	
S12.000	SEXRE	226.718	-0.042	0.000	0.61	3.6	OK	5
S12.001	SEX32	226.371	-0.099	0.000	0.25	6.4	OK	
S13.000	SEX30	226.716	-0.114	0.000	0.13	3.0	OK	
S12.002	SEX31	225.582	-0.051	0.000	0.77	12.0	OK	
S12.003	SEX33	224.357	-0.073	0.000	0.53	11.9	OK	3
S12.004	SEX34	224.062	-0.071	0.000	0.54	11.8	OK	
S1.007	SD01	222.519	-0.056	0.000	0.92	28.7	OK	
S1.008	SD02	222.383	-0.132	0.000	0.36	28.6	OK	
S1.009	SEX13	220.676	-0.129	0.000	0.35	26.4	OK	

from proposed developed



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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000


Number of Input Hydrographs 0    Number of Storage Structures 12  
Number of Online Controls 1    Number of Time/Area Diagrams 2  
Number of Offline Controls 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model    FSR    Ratio R 0.250  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)    19.000 Cv (Winter) 0.840  
Margin for Flood Risk Warning (mm)    300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status    OFF  
DVD Status    ON  
Inertia Status    ON


Profile(s)    Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	30 Winter	30	+0%	100/30 Summer				225.059
S1.001	SRWP	60 Winter	30	+0%					224.344
S1.002	S1	60 Winter	30	+0%	100/15 Summer				223.715
S1.003	S2	60 Winter	30	+0%	100/15 Summer				223.709
S2.000	S4	30 Winter	30	+0%					225.049
S2.001	SRWP	30 Winter	30	+0%					224.260
S3.000	S7	15 Winter	30	+0%	30/15 Summer				223.988
S1.004	S3	60 Winter	30	+0%	100/15 Summer				223.683
S1.005	S4	60 Winter	30	+0%	100/15 Summer				223.556
S4.000	S6	15 Winter	30	+0%	30/15 Summer	100/15 Summer			223.959
S4.001	S7	15 Winter	30	+0%	30/15 Summer				223.911
S4.002	S8	15 Winter	30	+0%	30/15 Summer				223.901
S5.000	SRE	15 Winter	30	+0%	30/15 Summer	100/15 Summer			223.980

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
S1.000	S1	-0.041	0.000	0.62		10.2	OK	
S1.001	SRWP	-0.256	0.000	0.05		10.7	OK	
S1.002	S1	-0.160	0.000	0.23		10.7	OK	
S1.003	S2	-0.142	0.000	0.35		19.4	OK	
S2.000	S4	-0.051	0.000	0.43		10.5	OK	
S2.001	SRWP	-0.239	0.000	0.08		10.2	OK	
S3.000	S7	0.038	0.000	1.13		20.3	SURCHARGED	
S1.004	S3	-0.106	0.000	0.74		41.1	OK	
S1.005	S4	-0.167	0.000	0.41		41.7	OK	
S4.000	S6	0.089	0.000	0.59		8.1	SURCHARGED	6
S4.001	S7	0.166	0.000	1.08		11.7	SURCHARGED	
S4.002	S8	0.176	0.000	0.35		12.8	SURCHARGED	
S5.000	SRE	0.150	0.000	0.87		5.1	SURCHARGED	7

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
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PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.000	SRE	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S5.001	S9A	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S4.003	S9	15 Winter	30	+0%	30/15 Summer			
S4.004	S10	15 Winter	30	+0%	30/15 Summer			
S7.000	S15	15 Winter	30	+0%	30/15 Summer			
S7.001	S11A	15 Winter	30	+0%	30/15 Summer			
S7.002	S11B	15 Winter	30	+0%	100/15 Summer			
S7.003	S11C	15 Winter	30	+0%	100/15 Summer			
S4.005	S11	15 Winter	30	+0%	1/15 Summer			
S8.000	S12A	15 Winter	30	+0%				
S4.006	S12	15 Winter	30	+0%	1/15 Summer			
S4.007	S13	15 Winter	30	+0%	1/15 Summer			
S9.000	S14	15 Winter	30	+0%				
S9.001	S15	180 Winter	30	+0%	100/15 Summer			
S10.000	S16a	180 Winter	30	+0%	30/15 Winter			
S4.008	S16	180 Winter	30	+0%	1/15 Summer			
S11.000	SRE	15 Winter	30	+0%	30/15 Summer			
S11.001	S16	15 Winter	30	+0%	30/15 Summer			
S11.002	S17	15 Winter	30	+0%	30/15 Summer			
S1.006	S5	180 Winter	30	+0%	1/15 Summer			
S12.000	SEXRE	15 Winter	30	+0%	30/15 Summer			
S12.001	SEX32	15 Winter	30	+0%	100/15 Summer			
S13.000	SEX30	15 Winter	30	+0%				
S12.002	SEX31	15 Winter	30	+0%	30/15 Summer			
S12.003	SEX33	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
S12.004	SEX34	15 Winter	30	+0%	30/15 Summer			
S1.007	SD01	15 Winter	30	+0%	30/15 Summer			
S1.008	SD02	15 Winter	30	+0%				
S1.009	SEX13	15 Winter	30	+0%				

PN	US/MH Name	Water			Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)			
S6.000	SRE	223.992	0.322	0.000	1.08		6.3	SURCHARGED	8	
S5.001	S9A	223.907	0.440	0.000	1.07		13.4	SURCHARGED	7	
S4.003	S9	223.889	0.473	0.000	0.87		28.2	SURCHARGED		
S4.004	S10	223.852	0.583	0.000	0.86		27.7	SURCHARGED		
S7.000	S15	226.457	0.087	0.000	1.11		17.8	SURCHARGED		
S7.001	S11A	226.302	0.052	0.000	1.40		17.9	SURCHARGED		
S7.002	S11B	226.134	-0.055	0.000	0.89		30.9	OK		
S7.003	S11C	226.023	-0.055	0.000	0.70		48.0	OK		

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S4.005	S11	223.817	0.695	0.000	1.92		55.7	SURCHARGED	
S8.000	S12A	224.621	-0.079	0.000	0.44		6.0	OK	
S4.006	S12	223.631	0.556	0.000	2.34		65.9	SURCHARGED	
S4.007	S13	223.410	0.449	0.000	1.59		66.2	SURCHARGED	
S9.000	S14	224.035	-0.115	0.000	0.12		3.1	OK	
S9.001	S15	223.313	-0.042	0.000	0.13		1.6	OK	
S10.000	S16a	223.309	0.329	0.000	0.33		17.4	SURCHARGED	
S4.008	S16	223.312	0.438	0.000	0.28		17.3	SURCHARGED	
S11.000	SRE	223.414	0.084	0.000	1.15		5.9	SURCHARGED	
S11.001	S16	223.365	0.075	0.000	0.70		9.3	SURCHARGED	
S11.002	S17	223.325	0.125	0.000	1.01		12.1	SURCHARGED	
S1.006	S5	223.307	0.637	0.000	1.86		23.8	SURCHARGED	
S12.000	SEXRE	226.996	0.236	0.000	1.28		17.5	SURCHARGED*	5
S12.001	SEX32	226.405	-0.065	0.000	0.59		15.4	OK	
S13.000	SEX30	226.738	-0.092	0.000	0.31		7.3	OK	
S12.002	SEX31	225.885	0.252	0.000	1.94		30.2	SURCHARGED	
S12.003	SEX33	224.948	0.518	0.000	1.31		29.7	SURCHARGED	3
S12.004	SEX34	224.440	0.307	0.000	1.36		29.6	SURCHARGED	
S1.007	SD01	222.683	0.108	0.000	1.53		47.7	SURCHARGED	
S1.008	SD02	222.416	-0.099	0.000	0.60		47.7	OK	
S1.009	SEX13	220.710	-0.095	0.000	0.58		43.5	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0    Number of Storage Structures 12  
Number of Online Controls 1    Number of Time/Area Diagrams 2  
Number of Offline Controls 0    Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model    FSR    Ratio R 0.250  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)    19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)    300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status    OFF  
DVD Status    ON  
Inertia Status    ON


Profile(s)    Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720,  
960, 1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	60 Winter	100	+40%	100/30 Summer			
S1.001	SRWP	60 Winter	100	+40%				
S1.002	S1	120 Winter	100	+40%	100/15 Summer			
S1.003	S2	120 Winter	100	+40%	100/15 Summer			
S2.000	S4	60 Winter	100	+40%				
S2.001	SRWP	60 Winter	100	+40%				
S3.000	S7	15 Winter	100	+40%	30/15 Summer			
S1.004	S3	180 Winter	100	+40%	100/15 Summer			
S1.005	S4	180 Winter	100	+40%	100/15 Summer			
S4.000	S6	30 Summer	100	+40%	30/15 Summer	100/15 Summer		
S4.001	S7	30 Summer	100	+40%	30/15 Summer			
S4.002	S8	15 Winter	100	+40%	30/15 Summer			
S5.000	SRE	60 Winter	100	+40%	30/15 Summer	100/15 Summer		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	225.240	0.140	0.000	1.15	19.1	SURCHARGED	
S1.001	SRWP	224.361	-0.239	0.000	0.09	19.1	OK	
S1.002	S1	224.162	0.288	0.000	0.37	16.9	SURCHARGED	
S1.003	S2	224.154	0.303	0.000	0.49	27.1	SURCHARGED	
S2.000	S4	225.069	-0.031	0.000	0.82	19.7	OK	
S2.001	SRWP	224.280	-0.219	0.000	0.16	19.7	OK	
S3.000	S7	224.393	0.443	0.000	1.89	33.9	SURCHARGED	
S1.004	S3	224.118	0.328	0.000	0.88	48.9	SURCHARGED	
S1.005	S4	224.043	0.319	0.000	0.46	47.7	SURCHARGED	
S4.000	S6	224.633	0.763	2.555	1.23	16.6	FLOOD	6
S4.001	S7	224.646	0.901	0.000	1.88	20.4	FLOOD RISK	
S4.002	S8	224.618	0.893	0.000	0.60	21.8	SURCHARGED	
S5.000	SRE	224.403	0.573	3.369	1.21	7.0	FLOOD	7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S6.000	SRE	60 Winter	100	+40%	30/15 Summer	100/15 Summer		
S5.001	S9A	30 Winter	100	+40%	30/15 Summer	100/15 Summer		
S4.003	S9	15 Winter	100	+40%	30/15 Summer			
S4.004	S10	15 Winter	100	+40%	30/15 Summer			
S7.000	S15	15 Winter	100	+40%	30/15 Summer			
S7.001	S11A	15 Winter	100	+40%	30/15 Summer			
S7.002	S11B	15 Winter	100	+40%	100/15 Summer			
S7.003	S11C	15 Winter	100	+40%	100/15 Summer			
S4.005	S11	15 Winter	100	+40%	1/15 Summer			
S8.000	S12A	15 Winter	100	+40%				
S4.006	S12	15 Winter	100	+40%	1/15 Summer			
S4.007	S13	180 Winter	100	+40%	1/15 Summer			
S9.000	S14	15 Winter	100	+40%				
S9.001	S15	180 Winter	100	+40%	100/15 Summer			
S10.000	S16a	180 Winter	100	+40%	30/15 Winter			
S4.008	S16	180 Winter	100	+40%	1/15 Summer			
S11.000	SRE	15 Winter	100	+40%	30/15 Summer			
S11.001	S16	180 Winter	100	+40%	30/15 Summer			
S11.002	S17	180 Winter	100	+40%	30/15 Summer			
S1.006	S5	180 Winter	100	+40%	1/15 Summer			
S12.000	SEXRE	15 Winter	100	+40%	30/15 Summer			
S12.001	SEX32	15 Winter	100	+40%	100/15 Summer			
S13.000	SEX30	15 Winter	100	+40%				
S12.002	SEX31	15 Winter	100	+40%	30/15 Summer			
S12.003	SEX33	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S12.004	SEX34	15 Summer	100	+40%	30/15 Summer			
S1.007	SD01	30 Winter	100	+40%	30/15 Summer			
S1.008	SD02	30 Winter	100	+40%				
S1.009	SEX13	30 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.000	SRE	224.404	0.734	4.477	1.20		7.0	FLOOD	8
S5.001	S9A	224.406	0.939	5.968	1.85		23.1	FLOOD	7
S4.003	S9	224.603	1.187	0.000	1.29		42.0	SURCHARGED	
S4.004	S10	224.669	1.400	0.000	1.27		41.0	SURCHARGED	
S7.000	S15	227.386	1.016	0.000	1.86		29.8	SURCHARGED	
S7.001	S11A	226.978	0.728	0.000	2.45		31.3	SURCHARGED	
S7.002	S11B	226.660	0.471	0.000	1.47		51.1	SURCHARGED	
S7.003	S11C	226.528	0.450	0.000	1.11		76.7	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S4.005	S11	224.698	1.576	0.000	2.56		74.3	SURCHARGED	
S8.000	S12A	224.653	-0.047	0.000	0.80		10.9	OK	
S4.006	S12	224.383	1.308	0.000	3.32		93.2	SURCHARGED	
S4.007	S13	224.001	1.040	0.000	1.20		49.7	SURCHARGED	
S9.000	S14	224.048	-0.102	0.000	0.22		5.7	OK	
S9.001	S15	223.953	0.598	0.000	0.22		2.7	SURCHARGED	
S10.000	S16a	223.946	0.966	0.000	0.50		26.9	SURCHARGED	
S4.008	S16	223.951	1.077	0.000	0.45		28.1	SURCHARGED	
S11.000	SRE	224.009	0.679	0.000	1.85		9.5	SURCHARGED	
S11.001	S16	223.953	0.663	0.000	0.43		5.6	SURCHARGED	
S11.002	S17	223.947	0.747	0.000	0.61		7.3	SURCHARGED	
S1.006	S5	223.942	1.272	0.000	3.07		39.2	SURCHARGED	
S12.000	SEXRE	227.380	0.620	0.000	1.86		11.0	FLOOD RISK*	5
S12.001	SEX32	227.075	0.605	0.000	0.79		20.8	SURCHARGED	
S13.000	SEX30	226.761	-0.069	0.000	0.55		13.2	OK	
S12.002	SEX31	226.539	0.906	0.000	2.77		43.3	SURCHARGED	
S12.003	SEX33	225.820	1.390	0.461	1.73		39.2	FLOOD	3
S12.004	SEX34	224.936	0.803	0.000	1.80		39.1	SURCHARGED	
S1.007	SD01	222.887	0.312	0.000	2.17		67.7	SURCHARGED	
S1.008	SD02	222.450	-0.065	0.000	0.85		67.7	OK	
S1.009	SEX13	220.745	-0.060	0.000	0.86		65.1	OK	

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